

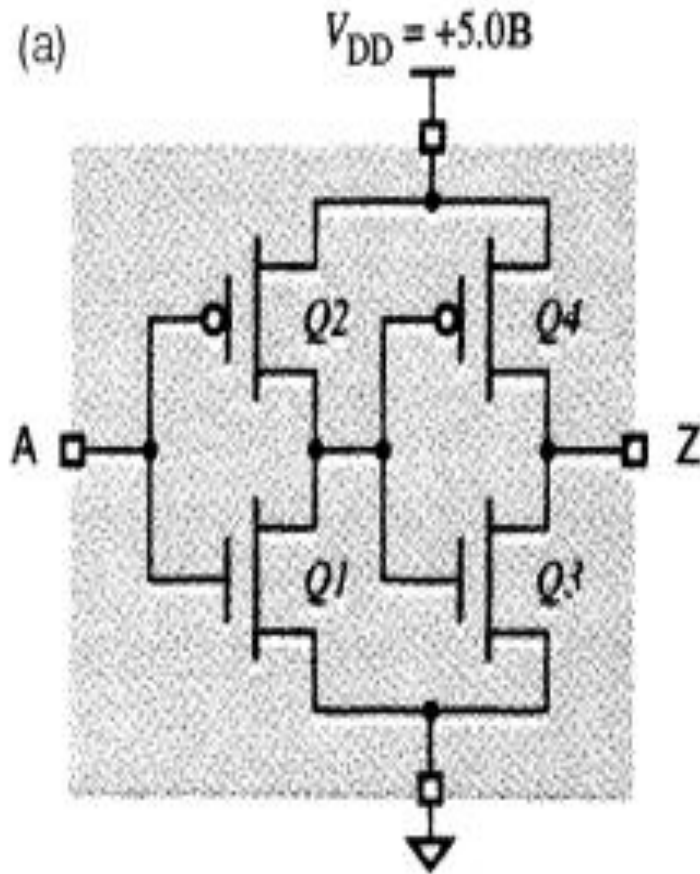
Неинвертирующие элементы, Двухуровневая логика на базе CMOS



Неинвертирующие элементы

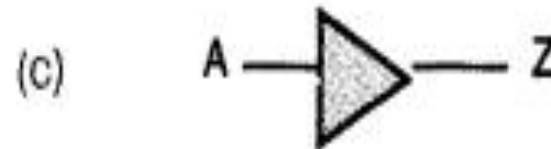
В КМОП-логике и в большинстве других логических семейств простейшими являются схемы инверторов, а следом за ними идут элементы И-НЕ и ИЛИ-НЕ. Инверсия получается «бесплатно» и обычно невозможно создать неинвертирующий элемент с меньшим числом транзисторов, чем в простом инверторе.

Неинвертирующий КМОП-буфер

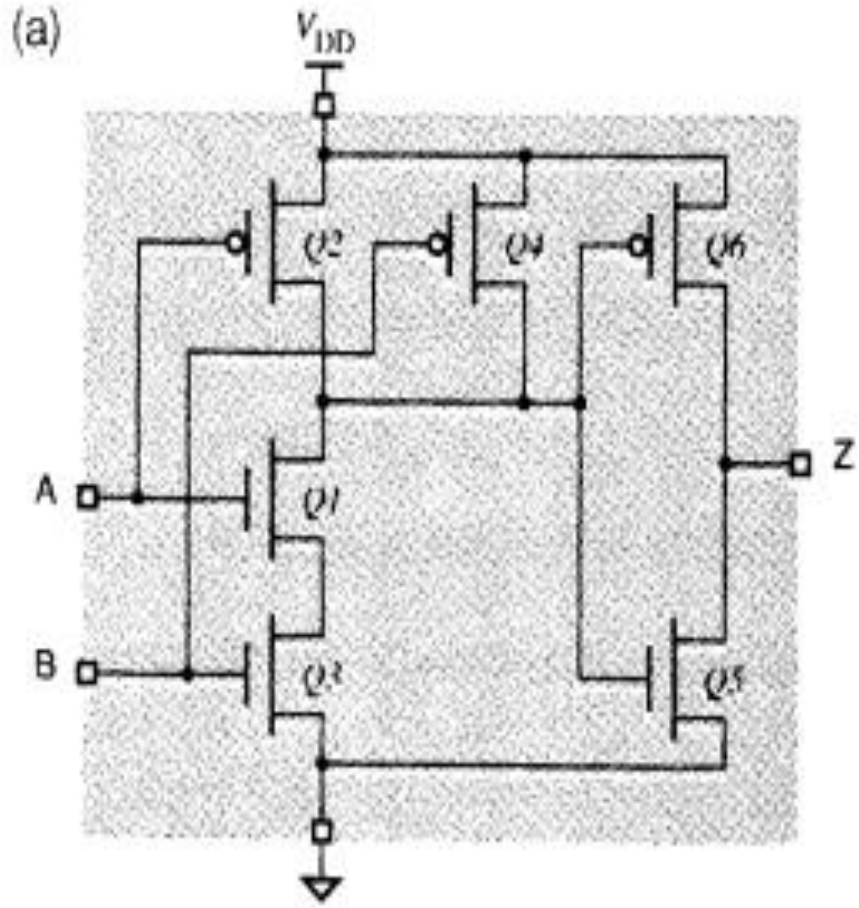


(b)

A	Q1	Q2	Q3	Q4	Z
L	off	on	on	off	L
H	on	off	off	on	H



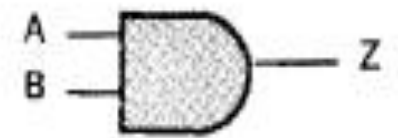
Двухвходовая КМОП-схема И



(b)

A	B	Q1	Q2	Q3	Q4	Q5	Q6	Z
L	L	off	on	off	on	on	off	L
L	H	off	on	on	off	on	off	L
H	L	on	off	off	on	on	off	L
H	H	on	off	on	off	off	on	H

(c)

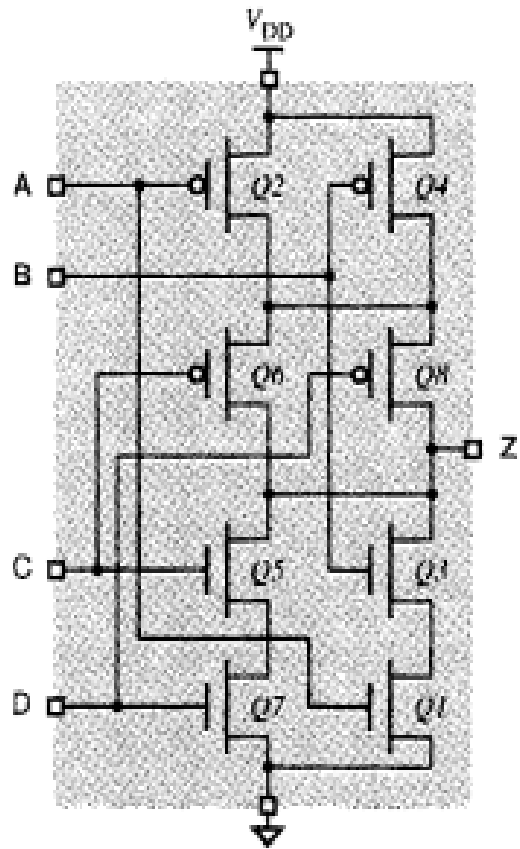




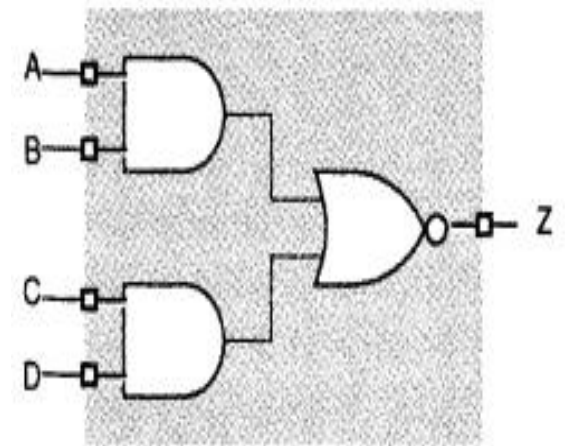
Двухуровневая логика на базе CMOS

➔ КМОП-схемы И-ИЛИ-НЕ и ИЛИ-И-НЕ

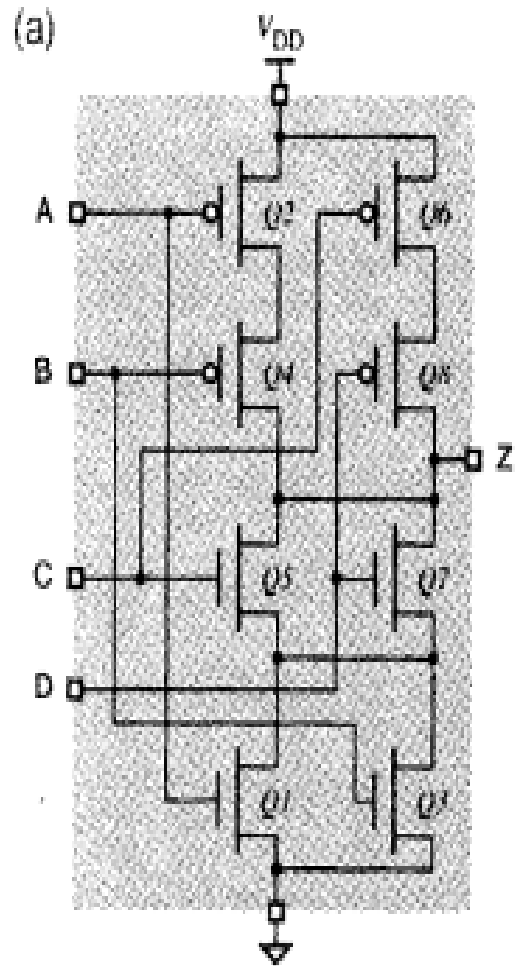
КМОП-схема И-ИЛИ-НЕ



A	B	C	D	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Z
L	L	L	L	off	on	off	on	off	on	off	on	H
L	L	L	H	off	on	off	on	off	on	on	off	H
L	L	H	L	off	on	off	on	on	off	on	off	H
L	L	H	H	off	on	off	on	on	off	on	off	L
L	H	L	L	off	on	on	off	off	on	off	on	H
L	H	L	H	off	on	on	off	off	on	on	off	H
L	H	H	L	off	on	on	off	on	off	off	on	H
L	H	H	H	off	on	on	off	on	off	on	off	L
H	L	L	L	on	off	off	on	off	on	off	on	H
H	L	L	H	on	off	off	on	off	on	on	off	H
H	L	H	L	on	off	off	on	on	off	off	on	H
H	L	H	H	on	off	off	on	on	off	on	off	L
H	H	L	L	on	off	on	off	off	on	off	on	L
H	H	L	H	on	off	on	off	off	on	on	off	L
H	H	H	L	on	off	on	off	on	off	off	on	L
H	H	H	H	on	off	on	off	on	off	on	off	L

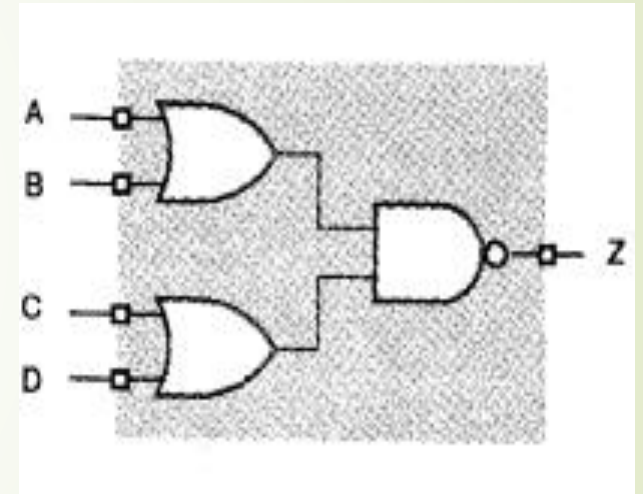


КМОП-схема ИЛИ-И-НЕ



(b)

A	B	C	D	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Z
L	L	L	L	off	on	off	on	off	on	off	on	H
L	L	L	H	off	on	off	on	off	on	on	off	H
L	L	H	L	off	on	off	on	on	off	off	on	H
L	L	H	H	off	on	off	on	on	off	on	off	H
L	H	L	L	off	on	on	off	off	on	off	on	H
L	H	L	H	off	on	on	off	off	on	on	off	L
L	H	H	L	off	on	on	off	on	off	off	on	L
L	H	H	H	off	on	on	off	on	off	on	off	L
H	L	L	L	on	off	off	on	off	on	off	on	H
H	L	L	H	on	off	off	on	off	on	on	off	L
H	L	H	L	on	off	off	on	on	off	off	on	L
H	L	H	H	on	off	off	on	on	off	on	off	L
H	H	L	L	on	off	on	off	off	on	off	on	H
H	H	L	H	on	off	on	off	off	on	on	off	L
H	H	H	L	on	off	on	off	on	off	off	on	L
H	H	H	H	on	off	on	off	on	off	on	off	L





Спасибо за внимание